OPERATIONAL RISK MANAGEMENT

User Training

User Training

- Deliberate ORM Process
- Hazard Identification Tools
- Hazard Assessment Tools
- Risk Assessment Tools

Operational Risk Management

Levels of Application

1. Time-critical - On the run consideration
2. **Deliberate - Application of the Complete 5-Step Process**
3. In-Depth – Complete 5-Step Process With Detailed Analysis

ORM Process

Deliberate ORM

1. Identify Hazards
   - A. Operational Analysis
   - B. Preliminary Hazard Analysis
2. Assess Hazards
3. Make Risk Decisions
   - A. Control options
   - B. Risk vs. Benefit
   - C. Communicate
4. Implement Controls
5. Supervise

ORM Process

Supervise
5
Identify Hazards
1
Assess Hazards
2
Make Risk Decisions
3
Implement Controls
4

1. Identify Hazards

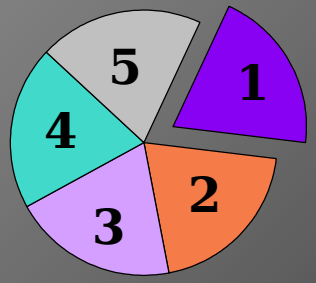
A. Operational Analysis

B. Preliminary Hazard Analys

(1) List Negative Events

(2) List Hazards

(3) List Possible Causes



Operational Analysis

Short Notice Deployment Preps

Review the accelerated pre-deployment sched

Consider integration of newly assigned Dets.

Review equipment/material requirements.

Plan stores requirements.

Review theater operating policies and plans.

Write/execute pre-deployment training sched

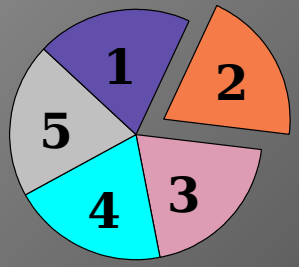
Analysis Reviewing Hazards Associated with an Accelerated Pre-deployment Schedule

eg Event:	Hazards:	Causes:
Non-Accomp	Unrealistic schedule/goals	Compressed tim
Non-Accomp/ uate Emerg Resp/ PRIMAR	Insufficient manning	PERSMAR behi
ion Mishap	Non-avail of Nav Trainer	Assets already sc
PRIMAR/ s Incident/ ounding	Insufficient proficiency	Lack of trng tim
l Damage/	High stress levels	Rush to get re

2. Assess Hazards

Prioritize Identified Hazards based on:

- **Severity of Possible Loss**
- **Probability of Possible Loss**



Hazard Assessment

Reviewing Hazards Associated with an Accelerated Pre-deployment Schedule

azard:	Severity	Probability	Priorit
stic schedule/goals	H	M	
ient manning	M	M	
ail of Nav Trainer	M	L	
ient proficiency	H	H	
ress levels	H	M	

3. Make Risk Decisions

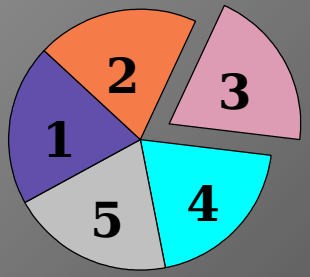
A. Consider Risk Control Options

(1) Most Serious Risks First

(2) Refer to PHA Causes

B. Risk vs. Benefit

C. Communicate as Required

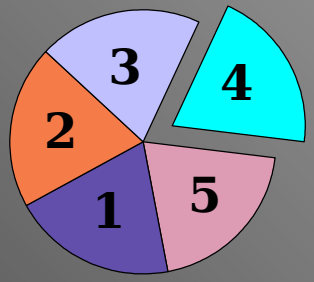


ORM Presentation Approaches

- Compare to Familiar Risks
- Total Losses Over Time
- Personal Impact
- Organizational Impact
- Cost Benefit

4. Implement Controls

- Engineering Controls
- Administrative Controls
- Personal Protective Equipme



Controls

Accelerated Pre-deployment Schedule

1. Formal communication w/ COC regarding assets/ readiness/tasking.

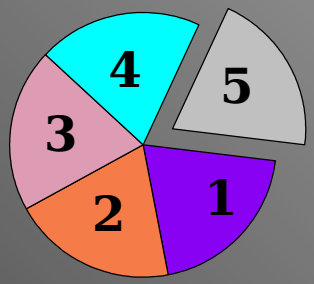
2. Careful recruiting and screening of personnel to fill shortfalls.

3. Discuss possibility of off-hour training with Nav School.

4. Pursue goals of tailored proficiency vice common training
   package with ISIC and ATG.

5. Supervise

- Monitor for Effectiveness of Controls
- Watch for Changes



ORM Process

Deliberate ORM

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Deliberate ORM Demonstration

ORM Process

Deliberate ORM

1. **Identify Hazards**
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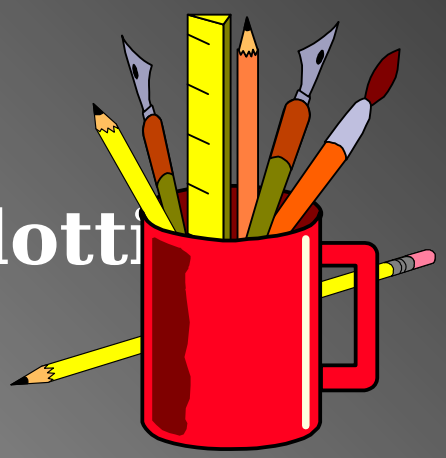
Basic Hazard Identification Tools

- **Operational Analysis:**
  - **Flow Chart**
  - **Simultaneous Timed Events Plotti**
    - **Affinity Diagram**



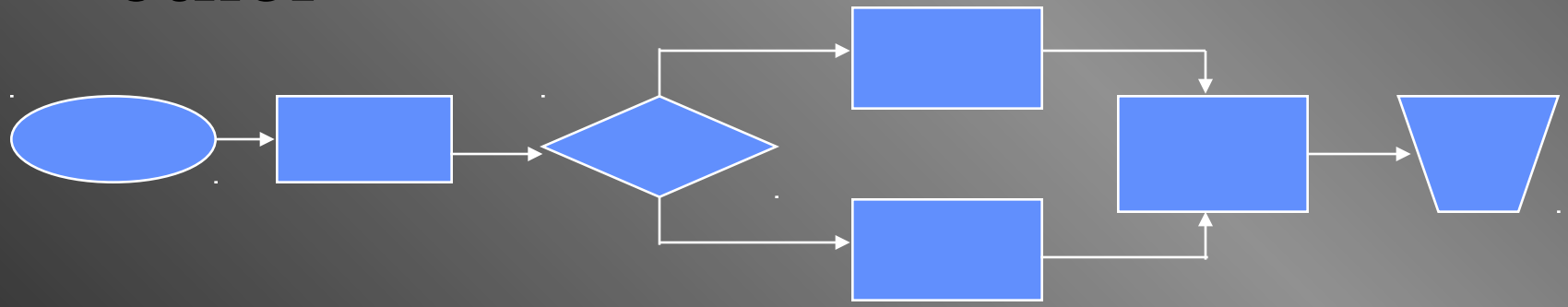
- Preliminary Hazard Analysis:
  - Change Analysis
  - Brain Storming
  - “What-if” and Scenario Thinking

Flow Chart

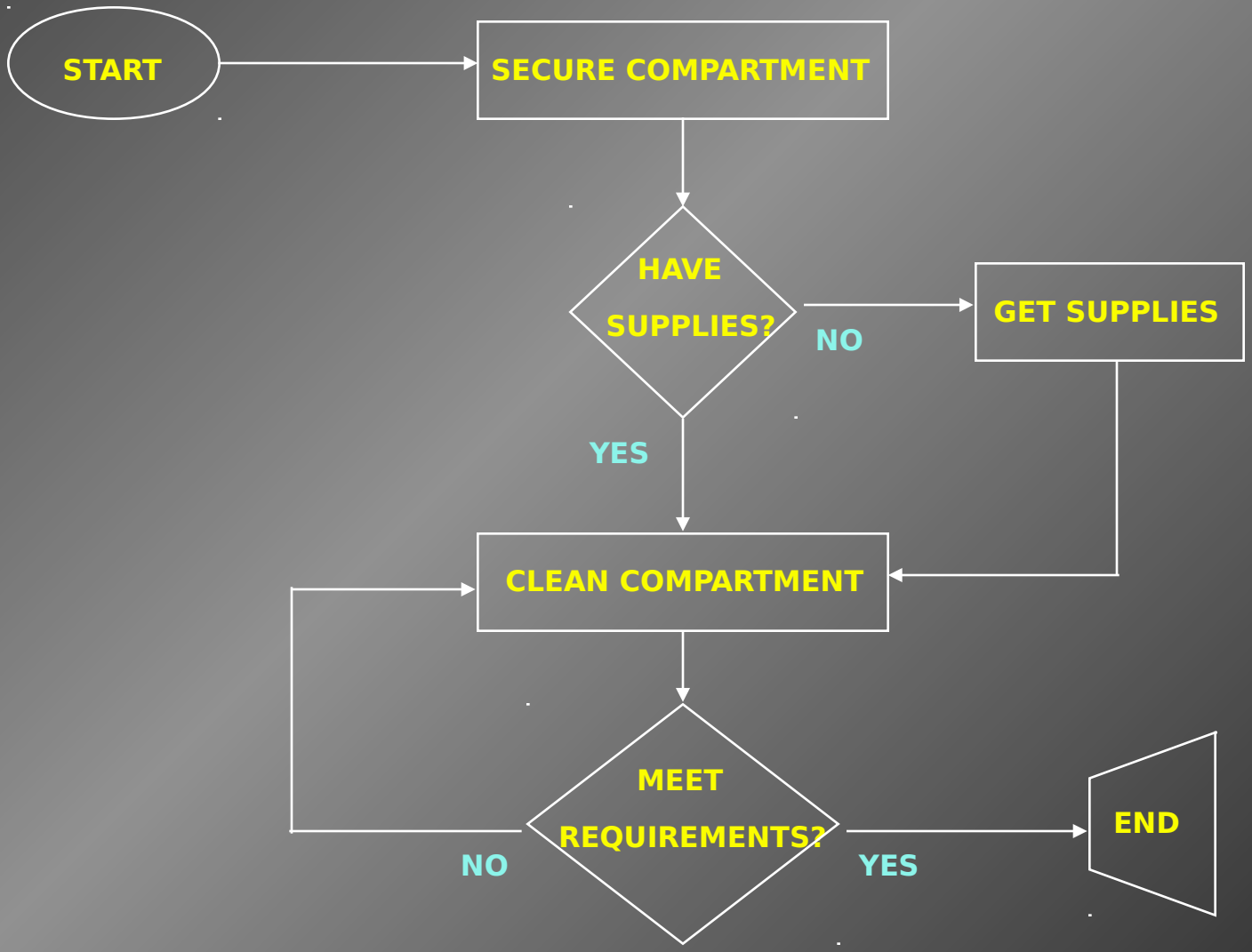
- Technique designed to depict the steps of an operation/process
- Application: Operational analysis
- Methodology:
  - Define the steps of an operation/process
  - Depict the interaction of each step

Flow Chart
(Cont.)

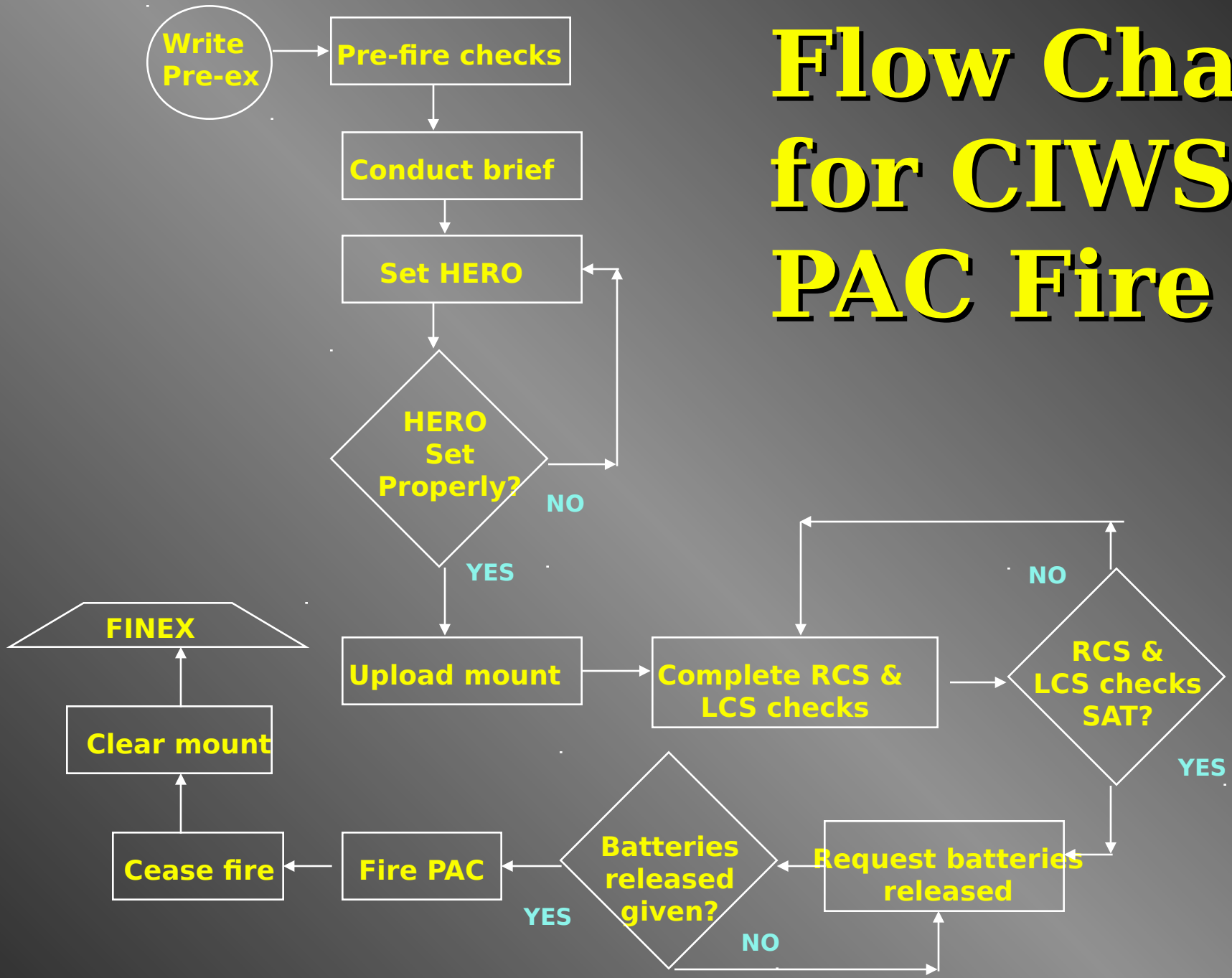
- Promotes understanding
- Compares actual process with ideal process
- Reveals how steps relate to each other



Flow Chart
(Cont.)



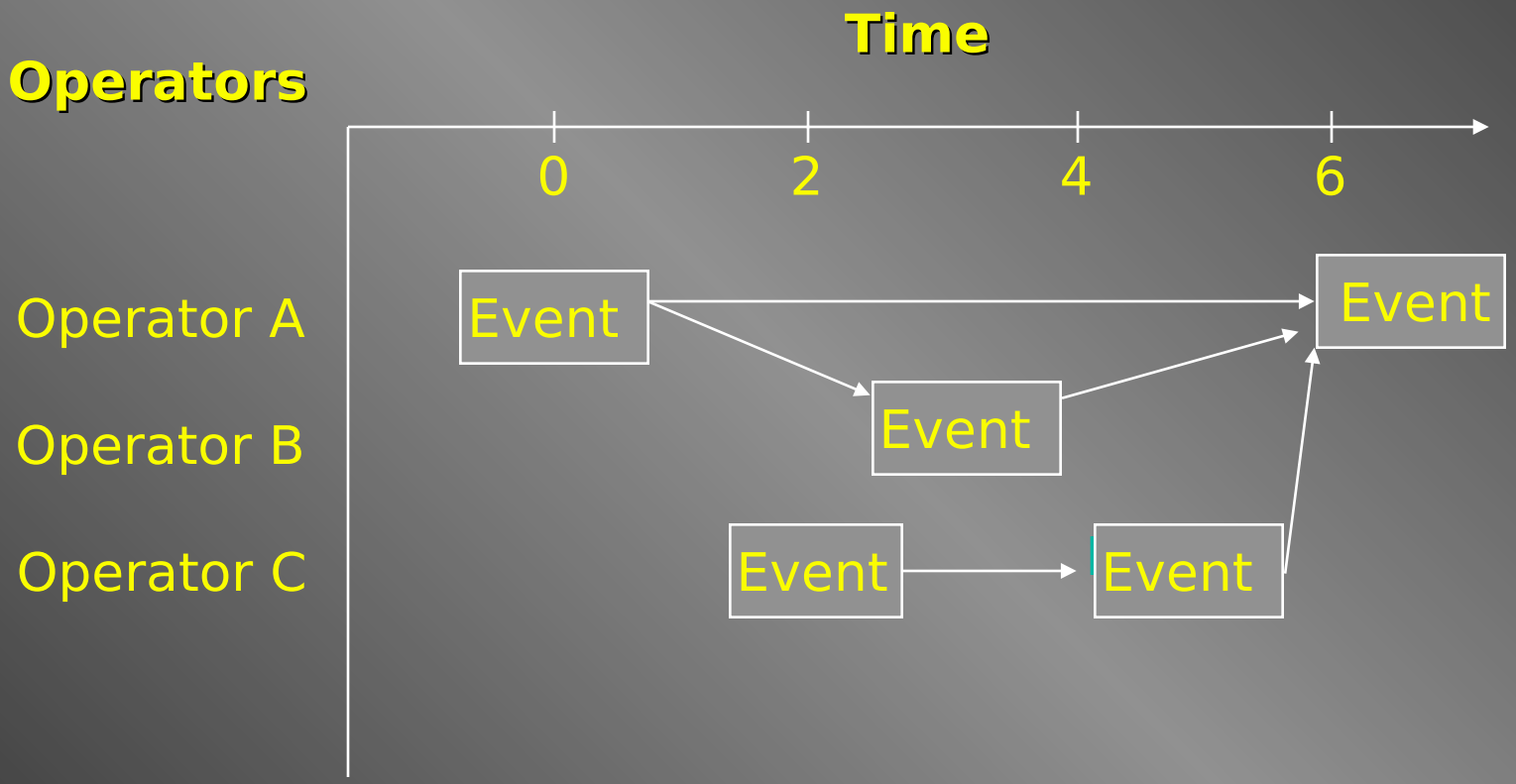
Flow Chart for CIWS PAC Fire



Simultaneously Timed Events Plotting (STEP)

- Technique used to chart “busy” operations in which several activities take place at or near the same time.
- **Application: Operational Analysis**
- Methodology:
  - Define the “operators”
  - Define the “events”
  - Diagram chronologically on timeline

Simultaneously Timed Events Plotting (STEP) (Cont.)



STEP (Cont.)
UNREP Station Maint

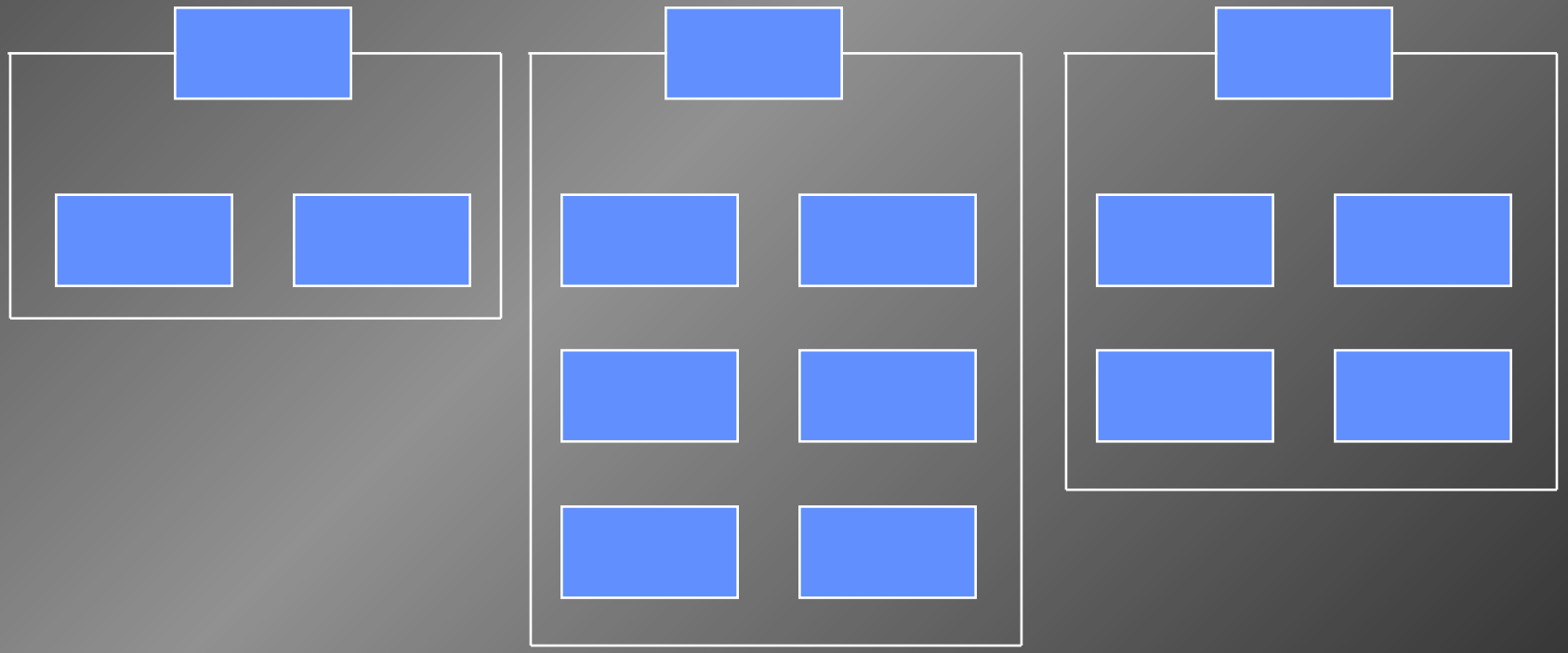
	Week 1	Week 2	Week 3	Week 4
n 1 (Fuel)	[Replace spanwire]			
n 2 (Fuel)		[--------HPU overhaul----------]		
n 3 (Cargo)				
n 4 (Cargo)				[Replace in/o
n 5 (Fuel)				
n 6 (Fuel)		[RAM overhaul]		

Affinity Diagram

- Technique which partitions a problem or issue into categories to focus brainstorming on one aspect of the problem at a time.
- Application: Operational Analysis and Preliminary Hazard Analysis
- Methodology:
  - Define the issue
  - Separate the issue into phases/categories
  - Brainstorm within each category
  - Collect/Display ideas

Affinity Diagram
(Cont.)

- More complete analysis of large volumes of data



Affinity Diagram
(Cont.)

AN/SPA-25F Repeater Upgrade

Maintenance

Parts
SE/Test Equipment
Maintenance Manuals
Interface w/ other equip
QA

Training/Quals

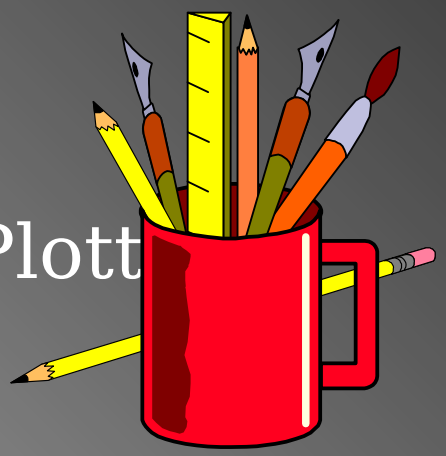
Bridge/CIC Personnel
Maintenance &
Test Procedures

Operations

Emergency procedures
Use in Navigation
Contact Tracking

Basic Hazard Identification Tools

- Operational Analysis:
  - Flow Chart
  - Simultaneous Timed Events Plott
    - Affinity Diagram



- **Preliminary Hazard Analysis:**
  - **Change Analysis**
  - **Brain Storming**
  - **“What-if” and Scenario Thinking**

Change Analysis

- Technique designed to identify hazards that arise from planned/unplanned change
- Applications:
  - Time critical ORM
  - Time-saving procedure for deliberate ORM
  - Investigative tool to detect changes that led to previous losses

Change Analysis
(Cont.)

- Methodology:
  - Review previous operation/current practices
  - Review Operational Analysis of planned operation
  - For each step/phase of the operation, identify differences (“changes”) between the two
  - Determine impact on risk of the operation

Change Analysis
(Cont.)
Elements to Consider

WHO: Operator, Fellow worker/unit, supervisor

WHAT: Equipment, Material, Energy

WHY: Trigger Event

WHERE: Environment

WHEN: Day/Night/Season, during operation, in personnel schedule

HOW: Procedures, controls

Change Analysis
(Cont.)
Navigation Detail into a New Foreign Port

- Environmental conditions expected
  - Weather/fog
  - Tides/currents/depths
- Competency and language skills of the pilots
- Mooring facilities and tugs
- Expected surface traffic
- Radio communications
- Navigational charts
  - Visual and radar points
  - Choke points/bridges/shoals

Brainstorming

- Technique which guides a group in exchanging/generating ideas
- Application: Preliminary Hazard Analysis
  - Separately
  - With other tools
- Methodology:
  - State question and time limit
  - Share and record ideas
  - Discuss ideas to ensure understanding

Brainstorming
(Cont.)

Guidelines

- Encourage active participation by all
- Develop a high-energy, enthusiastic climate
- Do not criticize or compliment ideas as they are presented
- Encourage creative thinking, including “out of the box” ideas
- Build and expand on the ideas of others
- Try to generate as long a list as possible within the allotted time

“What-if” Analysis

- Technique designed to visualize possible events or scenarios which could develop during an operation or process.
- Application: Preliminary Hazard Analysis
  - Separately
  - With other tools

“What-if” Analysis (Cont.)

- Methodology:
  - Develop an Operational Analysis of the operation
  - Apply a series of “what if” questions to each step/phase of the operation
  - Record identified hazards and causes
  - Expand into Scenario thinking, if desired

Guidelines for Scenario Development

- Target length - 5 or 6 sentences, 60 words
- Include elements of man, machine, material and method
- Start with history, but sanitize
- Encourage imagination and intuition
- Carry scenario to the worst credible outcome

Scenario Example

- An amphibious landing will be conducted on the southwest coast of Spain during an exercise.
- **Initial reports from the Naval Liaison Officer (NLO) indicate that the exercise area is also a popular commercial fishing area.**

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- **During this time of the year, fog is prevalent in the early morning hours.**

Scenario Example

- An amphibious landing will be conducted on the southwest coast of Spain during an exercise.
- Initial reports from the Naval Liaison Officer (NLO) indicate that the exercise area is also a popular commercial fishing area.
- During this time of the year, fog is prevalent in the early morning hours.
- **Previous experience shows that radar navigation in this area is only good to poor and may effect**

Basic Hazard Identification Tools

- Operational Analysis:
  - Flow Chart
  - STEP
  - Affinity Diagram

- Preliminary Hazard Analysis:
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  - Brain Storming
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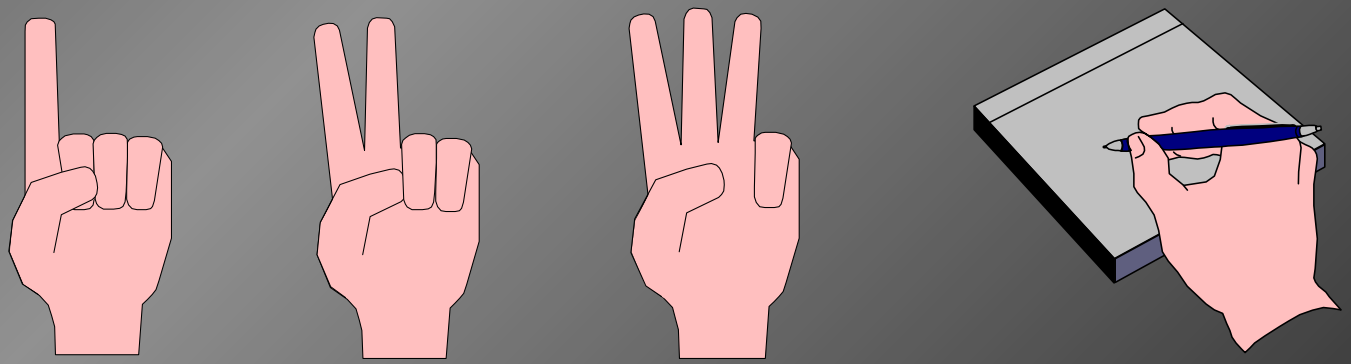
Hazard Assessment Tools

Risk Assessment Matrix

Severity	Probability A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
IV	3	4	5	5

Command Task Risk Assessment (Ranking)



Risk Assessment Matrix

- Technique designed to assess the risk associated with a hazard, based on severity and probability
- Application: Any hazard assessment, including hazards identified by multiple sources.
- Methodology: For given hazard,
  - Estimate hazard severity
  - Estimate mishap probability
  - Assign Risk Assessment Code (RAC)

Risk Assessment Matrix (Cont.)

Mishap Probability

Hazard Severity	A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
IV	3	4	5	5

Risk Assessment Matrix (Cont.)

- Subjective
- Less range than rankings
- Doesn’t consider collective risk of multiple hazards

Risk Assessment Matrix (Cont.)

Reviewing Hazards Associated with an Accelerated Pre-deployment Schedule

	Severity	Probability	RAC
Unrealistic schedule/goals 3	II	C	
Insufficient manning 2	II	B	
Non-Avail of Nav Trainer 4	III	C	
Insufficient proficiency	I	B	

Risk Assessment Matrix (cont.)

Tailored RA Matrix

Probability (expected frequency) of Failure

Hazard Severity	1/10	1/100	1/1000	1/10,000	1/100,000
I	1	2	4	8	12
II	3	5	6	10	15
III	7	9	11	14	17
IV	13	16	18	19	20

SSWG

Usage Rate (Probability)

Severity if out of stock	10/wk	5/wk	2/wk
NMC	1	2	3
PMC	2	3	4
FMC	3	4	5

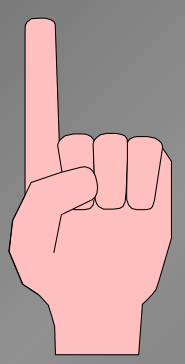
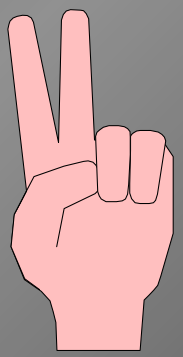
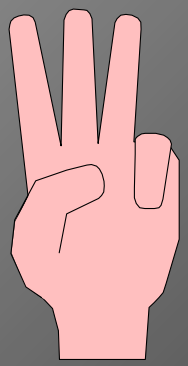
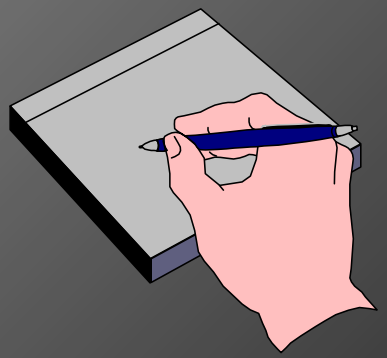
Supply planning

Hazard Assessment Tools

Risk Assessment Matrix

Severity	Probability A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
IV	3	4	5	5

ommand Task Risk Assessment (Ranking

Command Task Risk Assessment (Ranking)

- Technique which uses ranking to prioritize hazards according to severity and probability.
- Application: Relative assessment of hazards, especially suited to local command tasks.
- Methodology:
  - Rank hazards in order of severity
  - Rank hazards in order of probability
  - Add rankings for each hazard
  - Rank hazards by total

Command Task Risk Assessment

Hazard	Severity	Probability	Sum	Priority
A	3	1	4	1
B	1	4	5	2
C	4	2	6	3
D	2	5	7	4
E	5	3	8	5

Command Task Risk Assessment (Cont.)

- Entirely Relative
- Tendency to Minimize Low Ranking Hazards
- Re-ranking Required for New Hazards

Command Task Risk Assessment (Cont.)

Reviewing Hazards Associated with an Accelerated Pre-deployment Schedule

	Severity	Prob	Sum	Rank
istic schedule/goals	4	3	7	
cient manning	3	2	5	
ail of Nav Trainer	5	5	10	
cient proficiency	1	1	2	
tress levels	2	4	6	

Risk Assessment Tools

Identify Hazards and Assess their Risk

- Aviator RA Questionnaire
- Individual RA Questionnaires
  - On-duty
  - Off-duty/Leave
- Pre-flight/Scheduling RA Forms

Class Exercise

- Deliberate ORM Practical Exercise